

REMARKS

Upon entry of this Amendment, claims 1-12 are all the claims pending in the application. Claims 11 and 12 have been added. Claims 1-10 presently stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the alleged admitted prior art in view of Suganuma (USP 5,767,609). For the reasons set forth below, Applicant respectfully traverses the claim rejection and requests favorable disposition of the application.

Also, the Examiner is respectfully requested to acknowledge receipt and indicate approval of the drawings filed with the application on May 31, 2001.

Summary of Argument

The examiner asserts that the conventional control device described in the background section of the present application discloses everything recited in independent claims 1, 6 and 8 except for the pulse generator. For the pulse generator, the examiner relies on Suganuma. In particular, it is asserted that Suganuma discloses the claimed pulse generator at column 16, lines 1-6.

Regardless, however, of whether or not the pulse generator 130 shown in Fig. 28 of Suganuma meets all the requirements of the pulse generator claimed, for example in claim 1, Suganuma fails to teach or otherwise disclose the *pulse input means* and the *control panel control means*. In fact, the examiner has not even addressed these two limitations in the office action.

Argument

As recited in claim 1 of the subject application, a pulse input means receives the command pulses from the pulse generator and “calculates an amount of change in the received

command pulses per unit time.” Additionally, a control panel control means calculates an output frequency “based on the amount of change in the command pulses per unit time.” Neither the conventional device discussed in the background section of the subject application nor the device disclosed in Suganuma include either of the above-mentioned means or their attendant functions.

In accordance with one embodiment of the subject invention, “the pulse input means measures an encoder pulse and delivers the amount of change to the control panel control means.” (Page 11, lines 22-23). Further, “the control panel control means calculates the rate of change Δf in the frequency corresponding to the amount of change, and adds the rate of change to the present setting frequency.” (Page 11, line 24 through page 12, line 1).

Suganuma discloses a driving device for an ultrasonic motor. According to one embodiment a pulse generator is used in place of a variable resistor to control either the voltage or the frequency of the motor. Further, the pulse generator is substituted for the variable resistor only when the drive voltage to the motor is not within a certain range. The pulse generator disclosed in Suganuma is not at all similar to the claimed pulse generator of the subject application. It is disclosed, at column 16, lines 1-43, that the pulse generator is coupled to the rotor of the ultrasonic motor and generates pulses in response to the speed of the rotor. However, the pulse signal from the pulse generator is converted to a voltage signal by a frequency-to-voltage converter (F/V) and this voltage signal is then used as a speed voltage feedback signal to control the motor. The speed voltage feedback signal is compared to a constant reference voltage, which corresponds to the drive speed instruction signal for the motor. The result of the comparison, i.e., the difference between the actual speed and the instructed speed, is then amplified and used by a variable output power supply to control the speed of the

motor. In other words, the pulse generator disclosed in Suganuma operates as a standard feedback control loop and, thus, does not require anything like the claimed *pulse input means* or *control panel control means*.

For example, in Suganuma, any change in the pulses per unit time is neither required nor of any use in the feedback control loop. Accordingly, Suganuma neither teaches nor suggests either the pulse input means or the control panel control means as explicitly recited in claim 1. For at least this reason claim 1 and all claims dependent on claim 1, specifically, claims 2-5, are patentable over the proposed combination of Suganuma and the alleged admitted prior art.

For similar reasons to those set forth above for claim 1, claim 6 is patentable over the cited prior art as well. Specifically, the cited prior art combination fails to teach or suggest the recited control circuit that comprises a pulse input device operable to receive the control pulse signal and determine a change in the frequency of the pulses. In comparison, as discussed above, Suganuma discloses controlling the speed of a motor by comparing, i.e., determining the difference between, a fixed desired voltage input signal, representing the desired motor speed, and a signal that represents the frequency of the pulses, i.e., the actual speed of the motor at a given moment in time. Accordingly, claims 6 and 7 are patentable over the proposed combination.

Lastly, for similar reasons to those set forth above for claims 1 and 6, claim 8 is patentable over the cited prior art as well. Specifically, the cited prior art combination fails to teach or suggest the recited steps of determining a change in frequency with respect to the pulses and modifying the frequency set value for the device under control based on the change in

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frequency. As discussed above, Suganuma does not contemplate a change in frequency of the pulses. Accordingly, claims 8-10 are patentable over the cited prior art.

Patentability of New Claims


For additional claim coverage merited by the scope of the invention, Applicant has added new claims 11 and 12. Applicant submits that the prior art does not disclose, teach, or suggest the combination of features contained therein.

Conclusion

In view of the foregoing remarks, the application is believed to be in form for immediate allowance with claims 1-12, and such action is hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, he is kindly requested to **contact the undersigned** at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,


Kevin M. Barner
Registration No. 46,075

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE

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